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FIELD MANUAL

**AIR TRANSPORT
PROCEDURES
TRANSPORT OF THE W45-3
WARHEAD IN CONTAINER,
H-815, FOR MEDIUM ATOMIC
DEMOLITION MUNITION
(MADM)
BY US ARMY HELICOPTERS**

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HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1976



FIELD MANUAL

No. 55-226

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 30 July 1976

AIR TRANSPORT PROCEDURES

TRANSPORT OF THE W45-3 WARHEAD IN CONTAINER, H-815, FOR MEDIUM ATOMIC DEMOLITION MUNITION (MADM) BY US ARMY HELICOPTERS

	Paragraph	Page
Purpose and scope	1	1
Reporting of publication improvements	2	1
General safety and security considerations	3	1
Air transportability and handling data	4	2
Internal transport	5	4
External transport (emergency procedure)	6	9
APPENDIX. REFERENCES	—	12

1. Purpose and Scope

a. This manual presents Department of the Army approved procedures for internal and external transport by US Army helicopters of the W45-3 warhead for the medium atomic demolition munition (MADM) in shipping and storage warhead container, H-815 (also referred to as "item"). The W45-3 warhead in container, H-815, is a component of atomic demolition charges (ADC) M167, M172, and M175. This manual pertains to the UH-1 series, CH-47, and CH-54 helicopters. Materials and qualified manpower needed to prepare, load, tie down, and unload or rig and derig the item are prescribed herein. Where appropriate, metric equivalents are given in parentheses following the dimension or other measurement. References are shown in the appendix.

b. The procedures in this manual apply when the helicopter designated for the internal or external movement has an allowable cargo load capacity equal to or greater than the weight of one or more ADC. The described loads are not maximum helicopter loads. Additional internal cargo, including different types of nuclear weapons and/or personnel, within allowable load limits and restrictions prescribed by AR 50-5 and pertinent safety regulations (app), may be transported.

c. Times given to prepare, load, tie down, and unload or rig and derig the loads described in this manual may vary, depending upon existing conditions.

2. Reporting of Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded to Director, Military Traffic Management Command Transportation Engineering Agency, ATTN: MTT-TRP, PO Box 6276, Newport News, VA 23606. A reply will be furnished by the Agency.

3. General Safety and Security Considerations

WARNING

The container, H-815, with W45-3 warhead, is not to be jettisoned under any circumstances.

a. The following warnings will be observed by personnel performing operations, procedures, and practices that are included or implied in this manual. Disregard of these warnings could result in personal injury or loss of life.

(1) Prior to each nuclear cargo mission, the helicopter commander will familiarize himself with

the provisions of AR 50-5 and insure compliance therewith. In addition, he will become familiar with the security, safety, and technical peculiarities of the cargo that may affect air transport. Flight plans will include provisions for avoiding built-up and heavily populated areas. When transporting the ADC in the universal military pod by CH-54 helicopter, the pod must be secured to the helicopter to preclude jettisoning the pod deliberately or inadvertently. Procedures for securing the pod to preclude jettisoning are prescribed in paragraphs 13-5 and 13-6 of TM 55-1520-217-10/1 or in paragraphs 13-3 and 13-4 of TM 55-1520-217-10/2.

(2) To determine compatibility of any other nuclear weapons or other cargo as authorized in chapter 4, AR 50-5, for transport with the ADC, ordnance support channels must be consulted. Information on compatibility is contained in TM 39-45-51C and TM 38-250, which are distributed to major headquarters and direct support and general support levels. Restrictions listed in TM 39-20-7 will not be exceeded when additional types of nuclear weapons are transported along with the ADC. *No more than nine containers, H-815, with W45-3 warheads may be transported in a single group without waiver (TM 39-20-7).*

(3) Emergency destruction procedures for the ADC are contained in TM 39-50-8. Normally, emergency destruct materials will not be carried on the same aircraft as nuclear weapons. In the isolated case where operational necessity limits the availability of alternate aircraft, the theater commander may authorize emergency destruct materials (including blasting caps) to be transported in the load-carrying aircraft. Such materials will be in packagings authorized for transportation, isolated from weapons as far as possible, and tied down so as to prevent movement. Only the number of destruct charges and blasting caps necessary to destroy the ADC will be carried aboard. Blasting caps in their container (recommend use of M2 or M19 series ammunition boxes) will be stored separately and surrounded by a sandbag barrier.

(4) The ADC will be loaded and tied down in accordance with the procedures in this manual except that they may be repositioned for helicopter operational reasons, or when loading additional nuclear weapons or other cargo and/or personnel. If a location other than that shown in the respective tiedown diagram is used, the helicopter commander must insure that —

(a) The number and load capacity of the tiedown devices are as prescribed in this manual.

(b) The tiedown devices restraining the ADC are secured to tiedown fittings in the same location relative to the ADC as those fittings used in the pertinent tiedown diagram.

(c) The ADC is positioned in the cargo compartment with the longitudinal axis of the container oriented with the front to rear axis of the compartment.

b. The following operational precautions will be observed during loading, rigging, tiedown, transport, and unloading of the ADC:

(1) Web strap tiedown assemblies and slings, as used to secure or sling-transport the items described in this manual, are limited to a maximum time of usage (useful life) of 36 months. The time of usage will commence at the time the tiedowns and slings are unpackaged for use by the using organization. At that time they will be marked using stencil ink TT-I-559 (any contrasting color) with the current date (month and year) in at least ½-inch-high letters near the hook end of the strap.

(2) Prior to each usage, tiedowns and slings will be inspected for tears, punctures, or cuts. Additionally, metal items will be inspected for improper operation, corrosion, cracks, or distortion. If any of these conditions are present, or if the time of usage exceeds 36 months, the tiedowns or slings must be replaced. No testing of tiedowns or slings will be conducted. Additional storage, inspection, and maintenance criteria for tiedowns and slings are prescribed by 55-450-series technical manuals (app).

(3) When attaching tiedown devices to cargo and to tiedown fittings, approximately equal tension must be maintained throughout tiedown arrangements. Tiedowns must be checked during flight and tightened as necessary.

(4) Security and safety measures relative to guards, fire, or emergency destruction procedures, as established by pertinent publications (app), will be observed during all phases of air transport. All operations described herein will be in strict compliance with AR 50-106, TM 9-1300-206, and TM 9-1100-226-20.

(5) The high noise level of helicopter engines can cause permanent damage to ears. All personnel working in the vicinity will wear hearing protectors and avoid entering engine noise danger area. In addition, external cargo hookup personnel will wear goggles and protective headgear (hard hat, steel helmet, or flight helmet), and will use a static electricity discharge probe.

(6) The container, H-815, with W45-3 warhead, must not be exposed to a temperature of less than — 65° F.

4. Air Transportability and Handling Data

a. The ADC in the shipping and storage container, H-815, will normally be transported as an internal load. However, under emergency conditions, the item is also capable of being transported as an external load. The determination that external

transport is justifiable will be a deliberate command decision. Approximate dimensions and weight of the container (fig 1), with W45-3 warhead, are as follows:

Length	Dimensions		Weight
	Width	Height	
42.0 in. (1.07)	24.0 in. (0.61 m)	28.0 in. (0.71 m)	391 lb (177 kg)



Figure 1. Container, H-815, for W45-3 warhead.

b. Personal dosimetry (film badge) or special radiological handling procedures are not required, unless otherwise specified, for personnel engaged in operations described in this manual.

c. The cover end of the container, H-815, may face either forward or aft during internal air transport.

Container center of balance is approximately 24 inches (0.61 m) from the cover end.

d. The container, H-815, must be inspected for broken or cracked welds and damage other than minor scratches and abrasions. If the container is damaged to such an extent that its contents or

functions are affected, notify the support unit and submit a report in accordance with chapter 5, AR 50-5. Insure that container cover is secure.

5. Internal Transport

WARNING

Insure that the universal military pod is secured to the CH-54 helicopter to preclude jettisoning the pod either deliberately or inadvertently.

NOTE

Materials, procedures, and times pertinent to transport of one container H-815, are shown below and are to be adjusted when transporting multiple containers.

a. Preparation and loading by manhandling (primary method for all helicopters and for CH-54 helicopter universal military pod).

(1) *Materials.* Parking shoring: plywood, one

piece, 48- by 32- by 3/4-inch (may be used but is not required).

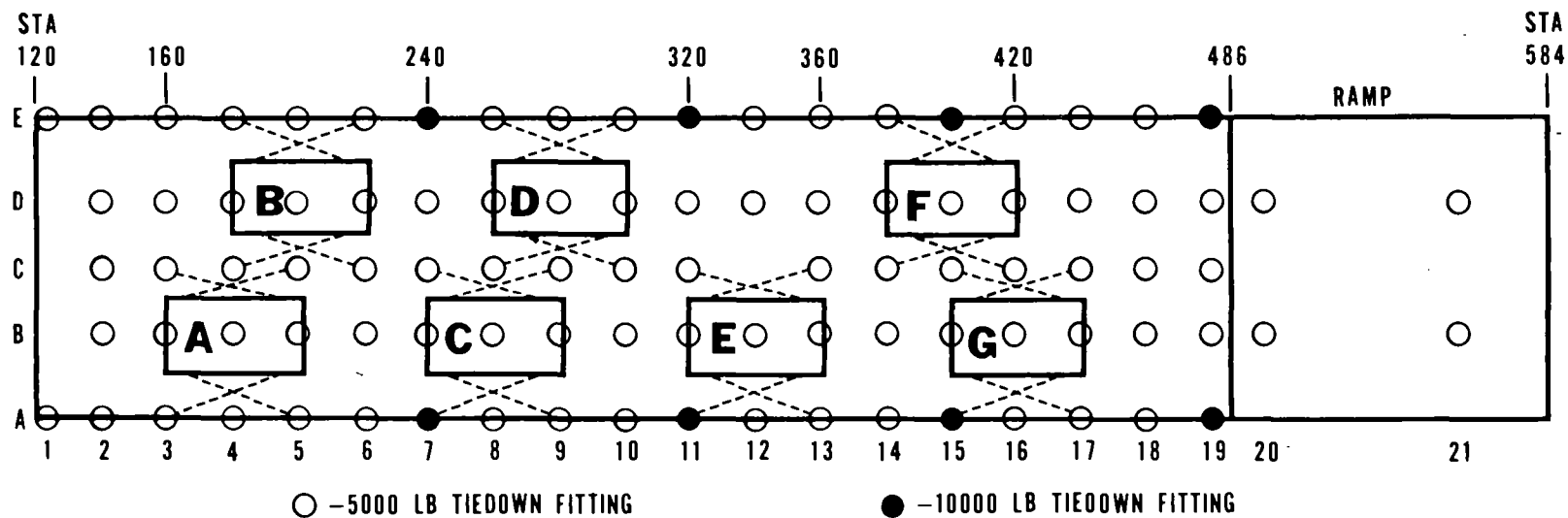
(2) *Loading.*

(a) Manhandle container, H-815, into helicopter or universal military pod and position at tiedown location (on parking shoring if used). Four men can prepare, load, and tie down the container in approximately 10 minutes.

(b) Tie down the container in the appropriate helicopter or pod in accordance with the following figures and tables:

<i>Helicopter</i>	<i>Figure No.</i>	<i>Table No.</i>
CH-47	2	1
UH-1C/M*	3	2
UH-1D/H	4	3
CH-54 (universal military pod)	5	4

* Cargo-floor-fitting pattern in the UH-1B helicopter is similar to the fitting pattern for the UH-1C / M helicopters. Strength of floor fittings in the UH-1 B / C / M helicopters is the same.



NOTE: UTILITY HATCH DOOR IS LOCATED IN THE CENTER OF THE FLOOR BETWEEN STATIONS 320 AND 360

Figure 2. Tiedown diagram for container, H-815, with W45-3 warhead, in CH-47 helicopter.

Table 1. Tiedown Data for Container, H-815, With W45-3 Warhead, in CH-47 Helicopter

Tiedown fitting			Tiedown device		Attach to item
Item	designation	capacity in 1,000 lb	type	capacity in 1,000 lb	
A	A3	5	CGU-1/B	5	Left rear tiedown clevis
	C3	5	CGU-1/B	5	Right rear tiedown clevis
	A5	5	CGU-1/B	5	Left front tiedown clevis
	C5	5	CGU-1/B	5	Right front tiedown clevis
B through G	Restrain each item in position shown in figure 2 and in manner prescribed for item A above.				

* MC-1 tiedown device may be used.

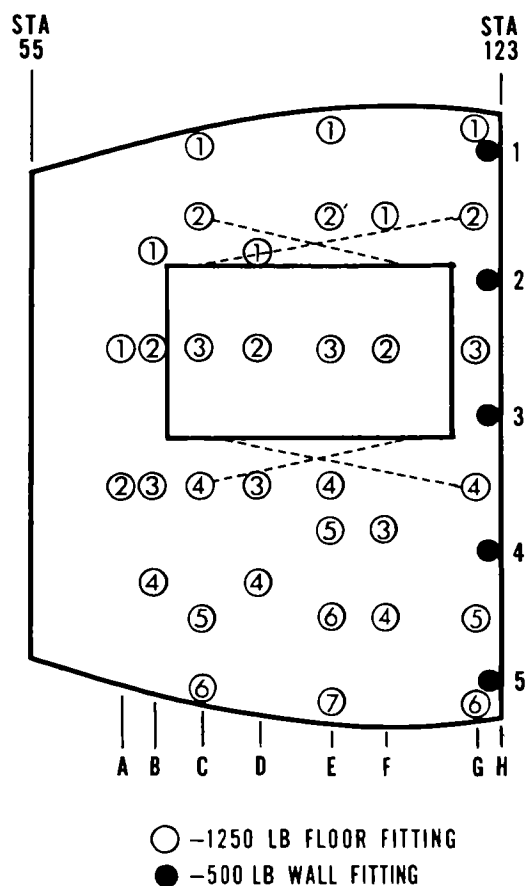


Figure 3. Tiedown diagram for container, H-815, with W45-3 warhead, in UH-1C/M helicopters.

Table 2. Tiedown Data for Container, H-815, With W45-3 Warhead, in UH-1C/M Helicopters

Tiedown fitting		Tiedown device		Attach to item
Designation	capacity in 1,000 lb	type	capacity in 1,000 lb	
C2	1.25	CGU-1/B		Right rear tiedown clevis
C4	1.25	CGU-1/B	5	Left rear tiedown clevis
G2	1.25	CGU-1/B	5	Right front tiedown clevis
G4	1.25	CGU-1/B	5	Left front tiedown clevis

* MC-1 tiedown device may be used.

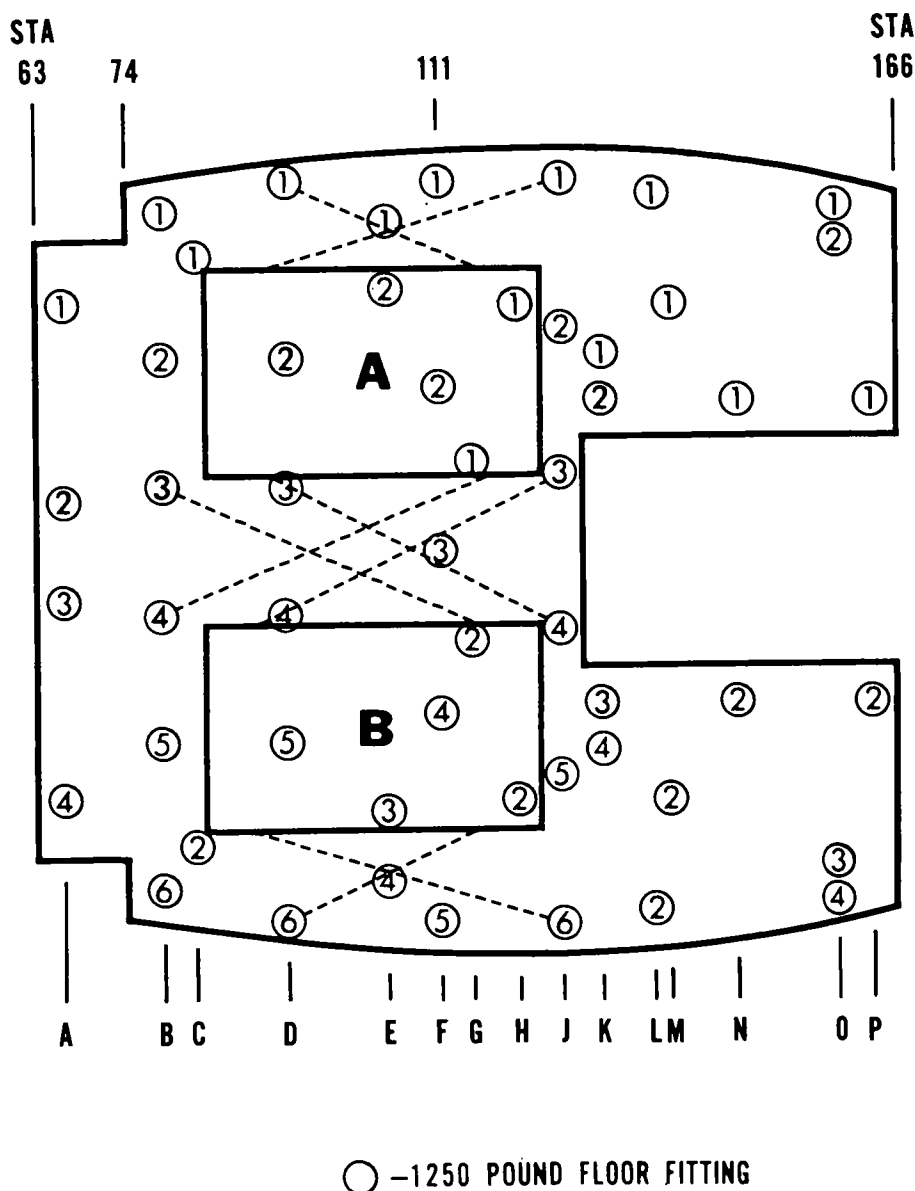


Figure 4. Tiedown diagram for container, H-815, with W45-3 warhead, in UH-1D/H helicopters.

Table 3. Tiedown Data for Container, H-815 With W45-3 Warhead, in UH-1D/H Helicopters

Item	Tiedown fitting		Tiedown device *		
	designation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
A	B4	1.25	CGU-1/B	5	Left rear tiedown clevis
	D1	1.25	CGU-1/B	5	Right rear tiedown clevis
	J1	1.25	CGU-1/B	5	Right front tiedown clevis
	J4	1.25	CGU-1/B	5	Left front tiedown clevis
B	B3	1.25	CGU-1/B	5	Right rear tiedown clevis
	D6	1.25	CGU-1/B	5	Left rear tiedown clevis
	J3	1.25	CGU-1/B	5	Right front tiedown clevis
	J6	1.25	CGU-1/B	5	Left front tiedown clevis

* MC-1 tiedown device may be used.

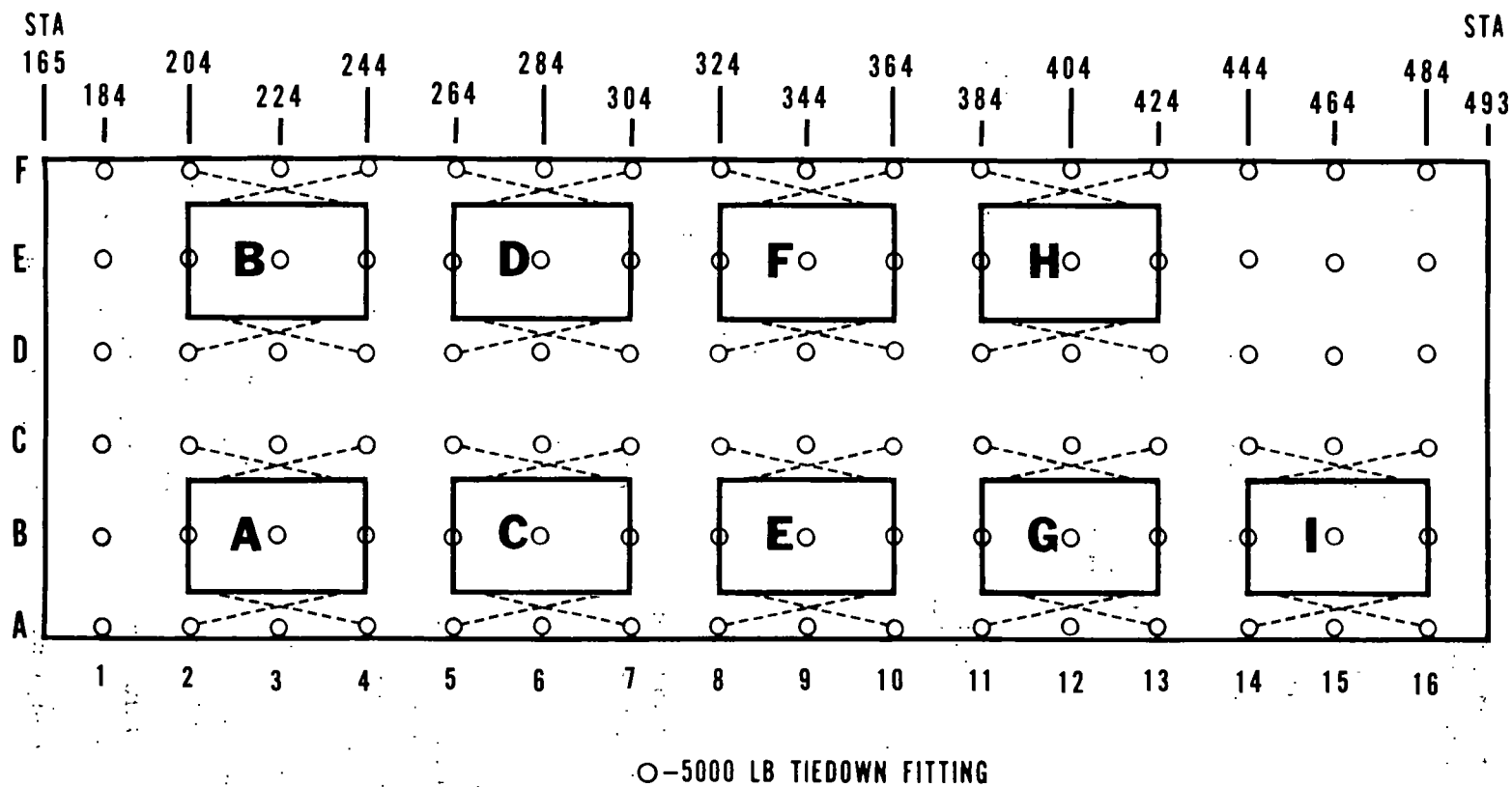


Figure 5. Tiedown diagram for container, H-815, with W45-3 warhead, in CH-54 helicopter universal military pod.

(3) *Unloading.* Four men can manhandle the container, H-815, from any of the helicopters or the pod in approximately 5 minutes.

b Preparation and loading using conveyors (secondary method for CH-47 helicopter and CH-54 helicopter universal military pod).

(1) *Materials.*

(a) Parking shoring: plywood, one piece, 48- by 32- by 3/4-inch.

(b) Bridge shoring: plywood, one piece, 48- by 32- by 3/4-inch (may be used but is not required).

(c) Rolling shoring: plywood or lumber, as required.

(d) Wheeled or roller conveyor: two sections, 4-foot (NSN 3910-00-926-1054), or equivalent.

(e) Blocking shoring: as required.

(2) *Loading.*

(a) Position rolling shoring and two auxiliary loading ramps (CH-47) to align with skids of container. Four men can prepare, load, and tie down the container, H-815, in approximately 10 minutes.

(b) Position parking shoring at container tiedown location, and extend rolling shoring from ground level into the cargo compartment to provide surface for conveyors.

Table 4. Tiedown Data for Container, H-815, With W45-3 Warhead, in CH-54 Helicopter Universal Military Pod

Item	Tiedown fitting		Tiedown device *		Attach to item
	designation	capacity in 1,000 lb	type	capacity in 1,000 lb	
A	A2	5	CGU-1/B	5	Left rear tiedown clevis
	C2	5	CGU-1/B	5	Right rear tiedown clevis
	A4	5	CGU-1/B	5	Left front tiedown clevis
	C4	5	CGU-1/B	5	Right front tiedown clevis
B through I	Restrain each item in position shown in figure 5 and in manner prescribed for item A above.				

* MC-1 tiedown device may be used.

(c) Place blocking shoring under loading ramps to decrease angle of entry.

(d) Position conveyors (wheels down) on rolling shoring and place bridge shoring (may be used but is not required) on conveyors.

(e) Position container, H-815, on bridge shoring (if used) or on conveyors.

(f) Push container on conveyors into cargo compartment to tiedown position, and apply temporary restraint to prevent movement. Leapfrog rolling shoring to minimize material requirements. As the container center of balance approaches the crest of the ramp hinge, the ramp (CH-47 only) may be raised to floor-level position for ease of loading.

(g) Tie down the container (on the conveyors) in accordance with a (2) (b) above.

(h) Reposition materials required during unloading, and tie down as directed by the helicopter commander.

(3) *Unloading.* Unloading procedures are essentially the reverse of loading procedures. Care must be exercised when container center of balance passes over ramp hinge. The ramp (CH-47 only) may be at floor-level position to receive container and is then lowered to ground level. Four men can unload the container, H-815, from any of the helicopters or the pod in approximately 5 minutes.

6. External Transport (Emergency Procedure)

WARNING

The contents of paragraph 6 are for information and training purposes only and are not to be construed as authority for external transport of the ADC by helicopter. Only dummy loads may be used for practice and/or training exercises. *War reserve nuclear weapons shall not be moved by external transport except in emergency conditions (that is, emergency evacuation from fire or flood) when the situation does not allow time to prepare and move the nuclear weapons by internal transport.*

WARNING

Always assume that a charge of static electricity is present on the helicopter. Use of some type of discharge apparatus (fig 4-1, TM 55-450-19) to ground the hook and discharge electricity is necessary to prevent shock when the hook is touched. After discharge of electricity, the hook is grasped quickly and firmly and held, if possible, until the hookup is completed. If contact with the hook is lost after initial grounding, the hook must be grounded again before it is touched. Do not use the load as a ground contact.

After air delivery and before handling, again ground to load to discharge any accumulated/retained static electricity.

CAUTION

When performing external air transport by CH-54 helicopter, a large metal clevis will be used to attach the load to the cargo hook as a nylon sling ring will tend to adhere to the hook thereby preventing release of the load. However, when performing similar transport by UH-1-series or CH-47 helicopter, a nylon sling ring will be used in lieu of a metal clevis to prevent damage to the cargo hook.

a. Transport of container, H-815, using air delivery cargo slings.

(1) *Materials.*

(a) Sling legs: four 8-foot, two-loop cargo slings (NSN 1670-00-753-3789) (each has rated capacity of 6,500 pounds).

(b) Sling ring: one 3-foot, three-loop cargo sling (NSN 1670-00-753-3788) (has rated capacity of 10,000 pounds), with link assembly, Type IV (NSN 1670-00-783-5988).

(c) Tape: 2-inch pressure sensitive (NSN 8135-00-266-5016), or suitable substitute.

(d) Vertical riser: one 8-foot, two-loop cargo sling (NSN 1670-00-753-3789) (has rated capacity of 6,500 pounds). For use with CH-47 helicopter, if required.

(e) Clevis assembly, large: one, air delivery, Type I (NSN 1670-00-090-5354). For use with CH-54 helicopter.

(2) *Rigging.*

(a) Choker-hitch one 8-foot sling leg to each shackle fitted in the lifting brackets on top of the container. Four men can rig the container (including vertical riser when used) for external transport in approximately 10 minutes.

(b) Twist each sling leg one turn for each 3 feet of sling.

(c) Combine the free ends of the sling legs to form a single loop, and attach this loop to the 3-foot sling. Connect free ends of the 3-foot sling with the link assembly, and safety tie the assembly to prevent accidental release. The 3-foot sling forms the apex for attachment to the helicopter cargo hook (UH-1-series and CH-47 helicopters). See Caution above regarding transport by CH-54 helicopter.

(d) Cluster and tape sling legs (breakaway technique) to prevent fouling during lift-off.

(e) In addition to the foregoing, the following procedure may be applicable when transporting the container by CH-47 helicopter: choker hitch one end of the 8-foot cargo sling to the sling legs; then attach the 3-foot sling to the upper loop of the 8-foot sling. Connect free ends of the 3-foot sling with the link

assembly, and safety tie the assembly to prevent accidental release. The 3-foot sling forms the apex for attachment to the helicopter cargo hook. The 8-foot sling (vertical riser) dampens vibration tendencies.

(3) *Derigging.* Four men can derig the container (including vertical riser when used) in approximately 5 minutes.

b. Transport of container, H-815, using sling, nylon and chain, multiple-leg.

(1) *Materials.*

(a) Sling set: one 23-foot, nylon and chain, four-leg sling (NSN 1670-00-902-3080) (has rated capacity of 15,000 pounds).

(b) Sling ring: one 3-foot, three-loop cargo sling (NSN 1670-00-753-3788) (has rated capacity of 10,000 pounds), with link assembly, type IV (NSN 1670-00-783-5988).

(c) Tape: 2-inch pressure sensitive (NSN 8135-00-266-5016), or suitable substitute.

(d) Vertical riser: one 8-foot, two-loop air-delivery cargo sling (NSN 1670-00-753-3789) (has rated capacity of 6,500 pounds). For use with CH-47 helicopter, if required.

(e) Clevis assembly, large: one, air delivery, Type I (NSN 1670-00-090-5354). For use with CH-54 helicopter.

(2) *Rigging.*

NOTE

Each nylon and chain sling leg is constructed of a 15-foot nylon web sling with a metal grab link on its lower end. The grab link is approximately 10 inches long and is equipped with a spring-loaded keeper. Attached to the lower or small end of the grab link is a hammer lock which connects the chain leg to the grab link. The chain leg is approximately 6 feet long and has 64 links. The link at the free end is referred to as link number 1.

(a) Pass one sling chain leg through each shackle fitted in the lifting brackets on top of the container. Four men can rig the container (including vertical riser when used) for external transport in approximately 10 minutes.

(b) Form a hitch at each shackle by passing the chain through the upper part of the grab link that attaches the chain to the nylon sling. Adjust chain length by forcing the selected link past the spring keeper into the lower part of the grab link to complete hitch. The spring keeper prevents the chain from sliding out of the grab link until the keeper is manually depressed and the chain is removed.

(c) The 12-inch ring of the sling forms the apex for attachment to the helicopter cargo hook

(UH-1-series and CH-47 helicopters). See Caution above regarding transport by CH-54 helicopter.

(d) Cluster and tape sling legs (breakaway technique) to prevent fouling during lift-off.

(e) In addition to the foregoing, the following procedure may be applicable when transporting the container by CH-47 helicopter: choker hitch one end of the 8-foot cargo sling to the 12-inch ring of the sling; then, attach the 3-foot sling to the upper loop of the 8-foot sling. Connect free ends of the 3-foot

sling with the link assembly, and safety tie the assembly to prevent accidental release. The 3-foot sling forms the apex for attachment to the helicopter cargo hook. The 8-foot sling (vertical riser) dampens vibration tendencies.

(3) *Derigging*. Depress spring-loaded keeper on grab link, and remove chain leg from link and from each container lifting bracket. Four men can derig the container (including vertical riser when used) in approximately 5 minutes.

APPENDIX

REFERENCES

1. Army Regulations (AR)

- | | |
|--------------|--|
| 10-16 | US Army Nuclear and Chemical Surety Group. |
| 40-14 | Control and Recording Procedures: Occupational Exposure to Ionizing Radiation. |
| 50-5 | Nuclear Weapons and Materiel: Nuclear Surety. |
| (C)50-106 | Safety Rules for Operations With the Medium Atomic Demolition Munition (MADM) (W45-3) (U). |
| 55-203 | Movement of Nuclear Weapons, Nuclear Components, and Related Classified Nonnuclear Materiel. |
| 95-27 | Operational Procedures for Aircraft Carrying Dangerous Materials. |
| 360-5 | Army Information: Public Information Policies. |
| 385-40 | Accident Reporting and Records. |
| (FOUO)700-65 | Nuclear Weapons and Nuclear Weapons Materiel. |
| 740-1 | Storage and Supply Activity Operations. |

2. Field Manuals (FM)

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| 1-100 | Army Aviation Utilization. |
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3. Technical Bulletins (TB)

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| (SRD) 9-1100-811-40 | Security Classification of Nuclear Weapons Information (U). |
| 385-2 | Nuclear Weapons Firefighting Procedures. |

4. Technical Manuals (TM)

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|------------------|---|
| 5-315 | Fire Fighting and Rescue Procedures in Theaters of Operations. |
| 9-1100-226-10 | Operator's Manual: M167, M172, and M175 Atomic Demolition Charges, XM3 and M4 Coder-Transmitters. |
| (C)9-1100-226-20 | Organizational Maintenance, M167, M172, and M175 Atomic Demolition Charges, XM3 and M4 Coder-Transmitters (U). |
| 9-1100-227-12 | Operator and Organizational Maintenance (Prefire Procedures for Employment), XM15 Atomic Demolition Charge Training Equipment. |
| 9-1300-206 | Ammunition and Explosives Standards. |
| 38-250 | Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft. |
| (C)39-0-1A | Numerical Index to Joint Atomic Weapons Publications (Including Related Publications) (Army Supplement) (U). |
| (SRD) 39-20-7 | Nuclear Safety Criteria (U). |
| (CRD)39-20-11 | General Firefighting Guidance for Nuclear Weapons (U). |
| 39-45-51 | Transportation of Nuclear Weapons Materiel. |
| (SRD)39-45-51A | Transportation of Nuclear Weapons Materiel (Supplement): Shipping and Identification Data for Stockpile Major Assemblies (U). |
| 39-45-51C | Transportation of Nuclear Weapons Materiel (Supplement): DOD Criteria, Courier Responsibilities, Military Shipment, and Vehicle Loading/Tiedown Procedures. |
| (CRD)39-50-8 | Emergency Destruction of Nuclear Weapons (U). |
| 55-450-8 | Air Transport of Supplies and Equipment: External Transport Procedures. |
| 55-450-11 | Air Transport of Supplies and Equipment: Helicopter External Loads Rigged With Air Delivery Equipment. |
| 55-450-12 | Air Transport of Supplies and Equipment: Helicopter External Loads for Sling, Nylon and Chain, Multiple Leg (15,000-Pound Capacity). |
| 55-450-15 | Air Movement of Troops and Equipment (Nontactical). |

55-450-18 Air Transport of Supplies and Equipment: Internal and External Loads, CH-47 Helicopter.

55-450-19 Air Transport of Supplies and Equipment: Helicopter External Lift Rigging Materiel, Techniques, and Procedures.

55-1100-226-12-7 Air Transportability Procedures, Atomic Demolition Charges XM167, XM172, and XM175 in U-6A Aircraft.

55-1520-209-10 Operator's Manual: Army Model, CH-47A Helicopter.

55-1520-210-10 Operator's Manual: Army Model, UH-1D/H Helicopter.

55-1520-217-10/1 Operator's Manual: Army Model, CH-54A Helicopters.

55-1520-217-10/2 Operator's Manual: Army Model CH-54B Helicopters.

55-1520-219-10 Operator's Manual: Army Model UH-1B Helicopter.

55-1520-220-10 Operator's Manual: Army Model UH-1C/M Helicopter.

55-1520-227-10 Operator's Manual: Army Model CH-47B and CH-47C Helicopters.

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